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ABSTRACT

This report on a project called Performance Assessment for Self-Sufficiency (PASS) covers activities conducted in the first stage of expert system development: the acquisition of knowledge to be used as the foundation for the expert system prototype. The project is developing an information system for anticipating the service needs of young persons with disabilities who are exiting from school; it involves having teachers provide information about the functional performance of students, and using expert system technology to convert teachers' assessments into useful information that special education and adult services agencies can use to anticipate service needs and to plan services. The data collection process uses the PASS instrument, which obtains teacher ratings of students in the areas of daily living, personal and social development, employment, and educational performance. This report focuses on the methodology used to acquire and embed the requisite expertise of recognized topic experts in the knowledge base and decision rules of the PASS expert system. The report outlines how the Delphi panel technique was used to acquire expertise from 31 topic experts, how a list of client characteristics associated with service needs under each of 16 service categories was generated, and how the results were used to structure the knowledge base for the system. Attachments include the PASS instrument, service categories and definitions, and examples of Delphi survey instruments. (JDD)

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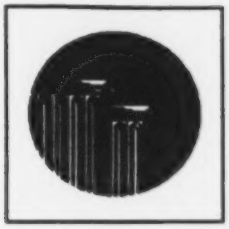

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Representing Knowledge Base Diversity in an Expert System Designed to Anticipate Service Needs for Students with Disabilities

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Background

The point of this paper is to show how methods in the social sciences aided in the process of acquiring knowledge from multiple experts for the purpose of constructing a knowledge-based expert system. The project, termed project PASS for *Performance Assessment for Self-Sufficiency*, is developing an information system for anticipating the service needs of young persons with disabilities who are exiting from the nation's schools — whether by graduating, earning a certificate, or reaching the maximum age for services guaranteed them under the Individuals with Disabilities Education Act (IDEA).

Anticipating Service Needs

The transition from secondary education to adult services represents a crucial breakpoint in providing for the needs of persons with disabilities. One key to assuring a smooth transition is to provide resource allocators and service providers with the information they need to project anticipated needs. Yet obtaining that information and making these projections in a way that is useful to service providers can be problematic, especially since teachers and other education agency staff who normally submit such data are unfamiliar with the purposes, functions, and service eligibility requirements of adult service agencies.

The above problems in the collection of accurate and useful data on the anticipated service needs of exiting students, as well as the need to bridge the gap between the education and adult service sectors, are widely acknowledged. Researchers and knowledge engineers at the American Institutes for Research (AIR) are attempting to bridge this information gap by developing an innovative approach to anticipating and reporting the service needs of exiting students with disabilities. This approach hinges around two components: (a) providing information about the functional performance of students that teachers can provide with accuracy, confidence, and minimal burden, and (b) using expert system technology to convert teachers' assessments into useful information that special education and adult services agencies at all levels can use to anticipate service needs and to plan services for young persons with disabilities.

These two components will operate as follows. First, teachers complete the PASS instrument, developed in an earlier study by AIR with well-known transition experts and state and local administrators and practitioners in special education and adult services, and tried out by teachers in a small pilot test in six school districts. The PASS instrument obtains teacher ratings of students for a broad array of functional performance indicators in four general domains: Daily Living, Personal and Social Development, Employment, and Educational Performance. The specific skills and behaviors targeted on the PASS instrument are ones that are typically required for adult life and that have service implications. For example, very low performance ratings on several specific indicators — such

as "moves self about in immediate neighborhood (e.g., walking, bicycling)," "uses public transportation if available (e.g., bus, taxi)," "uses maps and bus schedules when appropriate," etc. — suggest differing needs for assistance with mobility and transportation aspects of daily living. The PASS instrument also provides information about the student's training, education, and employment, as well as major problem behaviors. No special assessment is required: teachers complete the PASS based on what they already know about the student from direct observation or other reliable input. (See *Attachment A* for a copy of the PASS instrument.)

The second component of this new approach will be to use expert system technology for projecting 16 categories of service estimates for individuals and groups based on data from the PASS questionnaire. (See *Attachment B* for the list of the 16 service categories and their definitions.) Expert system technology refers to that branch of artificial intelligence dedicated to replicating the decision process of recognized topic experts in a manner that is both efficient (i.e., cost effective) and reliable.[1] Expert systems have been applied successfully to a number of problems in education and have recently found application in meeting the needs associated with special education.[2]

The purpose of the PASS expert system is to convert teachers' ratings of students on the assessment instrument, case by case, into individual or aggregated projections of adult service needs. The system is not meant to provide a *definitive* diagnosis of any one student's needs at the local level (although output from the system can and should be used for training, comparison, and initial consultation), rather it is designed to provide a foreshadowing of need for adult service providers at all levels (local, state, and national). Because of the data processing emphasis associated with this type of system development, the PASS expert system is being designed to complement state data systems.

Expert input is particularly important in development of the expert system and is the key to providing a reliable and useful data system for planners, policy makers, and practitioners at all levels. The subject of this paper is the methodology we used to acquire and embed the requisite expertise of recognized topic experts in the knowledge base and decision rules of the PASS expert system.

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[1] Barr, A. & Feigenbaum, E. A. (Eds.). (1982). *The handbook of artificial intelligence*. Palo Alto: HeirisTech Press.

[2] See, for example, Hasselbring, T. S. (1986). Specialized services and expert systems: An examination of the potential and reality. *Computers in the schools, 3*, 173-183; and Hofmeister, A. M. & Lubke, M. M. (1988). Expert Systems: Implications for the diagnosis and treatment of learning disabilities. Learning Disability Quarterly, 11, 287-291.

Representing Knowledge Base Diversity

Perspective

In general terms, knowledge acquisition and the accompanying process of structuring that knowledge involves a process in which human expertise is extracted and translated into the computerized expert system. The structured knowledge base, which consists of facts and decision rules obtained from topic area experts, forms the foundation of the system. As critics of artificial intelligence applications are quick to point out, however, the output from any expert system is only as good as the expertise from which it has been modelled. By incorporating the knowledge and heuristics of a human information processor into its knowledge base, any expert system at best reflects the idiosyncracies, biases, and frames of reference of the expert from which it was produced.

To meet the demands of a national data reporting technology, we recognized that the knowledge base from which the PASS expert system is built must be credible to a broad spectrum of potential end-users and to constituencies from multiple regions around the United States. Whereas many expert systems rely upon knowledge acquired solely from a single expert, our approach has been to deviate from that model, building the PASS information system to reflect knowledge as it is distributed throughout the field. Thus we sought to obtain multiple inputs from a diverse and representative group of experts reflecting the full spectrum of disability categories and adult service areas.

Several techniques in the social sciences have been developed over time for acquiring expertise from multiple sources.[3] These techniques vary in (a) whether they are iterative in nature or are conducted in a single round, and (b) whether they allow for face-to-face discussion or take a noninteractive approach. Iterative procedures include mechanisms for building consensus over cycles but tend to be difficult to coordinate and incur the risk that participants may drop out before the cycles have concluded. In contrast, single-round procedures are quicker to coordinate but are not self-correcting and must obtain all useful information from a single solicitation of the experts. With respect to interactive vs. noninteractive approaches, face-to-face procedures allow discussants to converse in real time providing a synergism for producing qualitative input as participants respond to others' probings and feedback. Noninteractive techniques lack the synergism of face-to-face discussion but are typically less expensive

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[3] cf. Shneiderman, M. V. (1982). Iterative procedures for forming expert judgments. *Automation and Remote Control*, a translation of *Avtomtika i Telemekhanika*, a publication of the Academy of Sciences of the USSR, *43*, *4*, 568-572.

to conduct — as participants do not need to travel to a common location — and have the advantage of overcoming the dominance and status mechanisms that otherwise might inhibit minority group members' input.[4]

The goal of knowledge acquisition in this project was first to obtain a breadth of input from a diversity of experts using a noninteractive, iterative appraoch and then to narrow the focus to a consensually approved and finite set of decision rules using a face-to-face, noniterative technique. To accomplish that goal, we began with a modification of the Delphi process, an iterative procedure that has the advantage of reducing the psychological drawbacks of exposure to authoritative opinion, reluctance to revise a publicly voiced opinion, and other inhibitory processes. With the Delphi panel as a starting point, we then convened a three-day, structured group interview with selected experts to synthesize Delphi results into a prototype knowledge base of decision rules that would serve as the basis for the expert system.

The Delphi Panel

Originally conceived over thirty years ago, the Delphi technique has found many applications in both the United States and abroad[5], and has been recognized as a valuable tool for building expert systems.[6] AIR has found the technique to be particularly useful for extracting knowledge from experts regarding the needs of students with disabilities.[7] The Delphi technique traditionally involves sending several rounds of questionnaires to an identified group of experts. In the first round, experts are asked to generate information relevant to a specific problem area. That information is then summarized and refined in successive rounds. The ultimate purpose of Delphi is to derive consensus from multiple sources of input. It should be mentioned that although Delphi panels are frequently quantitative in the summaries circulated to participating experts, revisionists of the procedure have reasoned that too much of a quantitative emphasis can lead to artificial convergence and suggest modifying the technique to provide qualitative feedback instead.[8]

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[4] For an example of how the dynamics of face-to-face discussion can serve to suppress ideas and polarize decision processes, see Janis, E. (1971) Groupthink. *Psychology Today, 5 (6)*, 43-46.

[5]Linstone, H. and Turoff, M. (eds.) (1975). *The Delphi Method: Techniques and Applications*. Reading, MA: Addison Wesley.

[6]Boose, John H. (1986). *Expertise transfer for expert systems design* (Vol 3. in Advances in Human Factors/Ergonomics). Amsterdam, The Netherlands: Elsevier.

[7]Weisgerber, R.A. and Smith, C.A. (1977) Improving vocational education services for handicapped students. (Report #G007500391). Washington, DC: Bureau of Occupational and Adult Education.

[8] cf. Schneiderman, M. V. (1982) *op. cit.*

We used the best features of this model: iterative cycles, input from multiple experts and balanced constituencies, and a focus on data deemed by consensus to be most critical. The Delphi process was conducted over three iterative rounds, described below, between February and May 1991.

Data Sources. We selected 31 special education and adult services experts to participate in the Delphi process. They were from diverse geographical regions, professional settings, and agency affiliations, and represented the full spectrum of adult service areas, and types and severities of disabilities. Each expert had at least three to four years of direct contact with clients with disabilities and is very knowledgeable about the client characteristics that trigger the need for essential services. (All 31 experts participated in the first two rounds of the Delphi, but one expert was unable to respond to Round 3.)

Round 1 procedure. We asked the experts to identify client characteristics that for each of 16 service categories were likely to trigger an essential service need. If an expert did not feel qualified to respond for a particular service category, they were asked to mark "don't know" on that form. Experts were also invited to comment freely about their decisions and about the definitions of service categories provided. Examples of the Round 1 format and responses for several service categories appear in *Attachment C.*

Experts had never seen nor did they have access to the PASS instrument while completing Round 1 (nor any other round of Delphi); therefore, their responses were based entirely on their own experience and were not influenced by client characteristics specifically addressed in the PASS. The 31 experts who completed Round 1 provided data of outstanding quality, depth, and variety. This rich and comprehensive data base formed the foundation needed for subsequent rounds of Delphi and for the development of the PASS expert system.

Analysis of Round 1 data. Four AIR project staff conducted an intensive, two-stage analysis and refinement of Round 1 data. The first step was a detailed analysis of the data and classification into content outlines that define the range of initial responses. This first step was conducted **independently** by two AIR staff members. The second step was the synthesis and refinement of the initial analysis, conducted by the Project Director and Senior Advisor. The analyzed results were organized as separate summaries for each of the 16 service categories. Each summary, or outline, presented the characteristics that had been identified by the experts as ones triggering in their minds an essential service need. In addition, specific examples of these client characteristics as encountered by the experts were provided. This summary formed the substance of the materials mailed to Delphi experts in Round 2, described below.

Round 2 Procedure. The primary purpose of Round 2 was to identify those client characteristics that should be included in the decision rules for the expert system (i.e., the "if-then" rule structure that the system software uses to project service needs). Because the expert system must define a finite and economical set of rules, each expert's task in Round 2 was to identify *only* those client characteristics in each of the 16 summaries (the outlines from Round 1) that would definitely trigger their decision to indicate a service as being *essential* for the individual. Therefore, for Round 2, we asked experts to assess the client characteristics provided in Round 1 in terms of their importance for being included in the expert system, using a forced-choice ranking system of *Very Important, Unimportant,* or *Undecided.* The rating scheme compelled the experts to identify among the several hundred client characteristics from Round 1 those that were absolutely critical to include in the decision rules for the PASS expert system.

Secondary goals of Round 2 were to verify whether the 16 summaries (outlines) accurately and adequately captured the information provided by experts during Round 1, to identify any gaps or inappropriate classifications in the outlines, and to assess the adequacy of the service list definitions. An example of the Round 2 format for one of the 16 service categories appears in *Attachment C.*

Analysis of Round 2 data. In order to quantify Round 2 results, responses were coded on a three-point scale: *Important = +1; Unimportant = -1; Undecided = 0.* Items with no responses were coded with an asterisk (*). Sum values were calculated for each client characteristic rated and were then adjusted by the number of respondents who rated the characteristic to obtain a proportional rating, or "rating index" (i.e., the sum value was divided by the number of respondents to obtain an adjusted sum). We established a threshold value for the rating index of .60 and above to identify those characteristics that expert consensus indicated were essential to include in the knowledge base and the rule structure for the PASS expert system. Characteristics that were at or above the threshold value became the basis for shortened lists of client characteristics, one list for each of the 16 service categories.

Round 3 procedure. The primary purpose of Round 3 was to "map" those client characteristics that experts considered *essential* for inclusion in the expert system onto the major content areas in the PASS instrument and to identify gaps in the instrument's coverage. This "map" was to serve as a guide, or template, for the committee of experts meeting subsequently to use in formulating preliminary decision rules for the expert system.

We provided the Delphi panel with a content outline of the PASS and a list of the selected client characteristics in each of the 16 service categories (a content outline and example of one service category appear in *Attachment C.*) We asked them to indicate one or more topic areas in the PASS's outline with which each characteristic in the 16 lists might be associated. To simplify the experts' task, we conducted our own "mapping" analysis and suggested

the topic area(s) that in our best judgment was associated with each client characteristic and asked experts to indicate their agreement with our judgments. Also at this time, we invited comments about the general content of the PASS instrument, the 16 lists of client characteristics from Round 2, and the service category definitions.

Analysis of Round 3 data. In general, expert input from Round 3 indicated considerable agreement with the preliminary mapping recommendations. We summarized expert input from Round 3 and created a matrix to describe the overall linkage of PASS domains to service categories reflected in Round 3. This matrix (see *Attachment D*) provided a framework for the deliberations of the Template Committee in formulating preliminary decision rules for the expert system.

Using the Delphi Results to Structure the Knowledge Base for the PASS Expert System

After completing all three rounds of Delphi — and as an integral part of obtaining expert and end-user input throughout the project — AIR convened a three-day meeting of a Template Committee at AIR's Palo Alto Office. Three outside consultants and the AIR project team participated in the Template Committee meeting. Two of the consultants had participated in the Delphi process. One was a vocational rehabilitation counselor for the State of California Department of Rehabilitation; his perspective represented a service provider for "high-functioning" adults with disabilities. A second outside consultant was the executive director of an adult independent living center; her perspective represented a service provider for "low-functioning" adults with disabilities. The third outside consultant was a nationally known and respected university-based transition researcher with expertise in assessment for transition planning, scales of independent behavior, and the role of interagency collaboration in statewide transition planning.

Template Committee Proceedings

The meeting followed an agenda that involved two principal activities: (a) a *protocol analysis* of expert decision making strategies using three "case study" PASS instruments, and (b) the development of preliminary decision rules.

Protocol analysis. Protocol analysis is a knowledge acquisition tool borrowed from cognitive psychology that allows expert system designers to study the cognitive decision making strategies of experts. Quite simply, the technique involves giving experts a task to do, such as solving a problem, and asking them to describe aloud the mental activities they undertake to complete the task. In the present context, members of the Template Committee were asked to consider three simulated case studies of exiting students with disabilities. The case studies were

created so as to depict hypothetical students with diverse disabilities and varied patterns of functional performance. For the first case, each member of the Committee was given a copy of a completed PASS instrument. The three external consultants were then asked to identify which services, selected from among the 16 service categories, they would recommend based only on the data contained in the PASS. The three experts were asked to take turns verbalizing orally the mental processes they were going through to reach their conclusions. For the second and third case histories, experts were asked to reach conclusions independently and to make written notes of the information they used to reach their decisions. When finished, they were invited to share their decisions and their rationales with the group and to ask probing questions of others' conclusions. By the end of the exercise, the Committee had been able to reach an encouraging level of consensus on all three case histories.

From the protocol exercise, the AIR team observed that the expert decision makers reached their conclusions by working through the PASS information hierarchically. As the experts reported, since it was too difficult to maintain all informational items of the PASS in memory, they would mentally summarize information into manageable units as they went (a process referred to as chunking by cognitive psychologists). For example, in deciding which service categories were applicable based on PASS data, they would go to each of the four major functional performance areas of the PASS (*Daily Living, Personal and Social Development, Employment, Educational Performance*) and derive from the specific behavior ratings, overall subjective summaries of how well the student had been performing in each area. Then, with overall subjective scores in mind, they would weigh the importance of those four major areas against each other and against information from the descriptive portions of the PASS in order to reach a final conclusion. The importance of chunking became obvious when extracting *specific* decision rules, as will be described presently.

Before moving on to the specification of decision rules, the Template Committee considered *what information the PASS expert system should produce* and *how the system should manage incomplete information*. The Committee concluded that the PASS Expert System should produce two types of conclusions. First, the system must conclude which of the 16 services, either singularly or in combination, would be needed by the exiting student as he or she entered the auspices of adult services. Second, the system should also provide information for judging the severity of that need. In both cases, the system should alert the end-user when not enough information was available to provide a trustworthy conclusion. Thus, in addition to indicating which of the service categories are needed, the system should indicate whether that need was considered to be of *primary* importance (i.e., critical and demanding immediate attention irrespective of budgetary and other pressures), of *secondary* importance (present but the service provider may utilize a greater degree of personal discretion), or *unknown* given a lack of information in the PASS.

Development of preliminary decision rules. To develop a preliminary set of specific decision rules, the Template Committee followed a process that was a complete reversal from that used during protocol analysis. Whereas protocol analysis required experts to begin with a completed PASS instrument and to move toward conclusions regarding service categories, rule specification required that experts begin with the service category and identify all the necessary preconditions in the PASS that would be useful for making reliable service predictions. This process required that the experts work backwards from potential conclusions to (a) identify those items in the PASS (i.e., the objects) that would be needed to reach a conclusion for each service category, (b) identify levels of severity among those items that would lead to distinguishing primary and secondary categorizations of those needs, (c) decide how information from the PASS items would be logically combined to reach those conclusions, and (d) decide what degree of missing information would threaten the reliability of the conclusion and thus warrant a conclusion that more information was needed.

To aid in this hierarchical knowledge acquisition, a hypertext computerized display tool was constructed using ToolBook® for the IBM PC. The tool, displayed on multiple video display terminals so members of the Committee could follow, prompted members to create and record decision rules at the global level first and then proceed to finer levels of detail. It did this by presenting an initial screen composed of the more general categories first (i.e., Disabling Condition, Daily Living Skills, Social Development, Employment, Educational Performance, Problem Behaviors, and others — see Figure 1) and then allowing the Committee to select any single category for further expansion and definition. Since the tool had been written in a hypertext language, it allowed for fast sequencing to finer levels of detail by simply pointing to the desired category with a mouse and clicking. The screen would refresh itself and display prompts necessary for consideration at the lower level. Using this technique, the Committee was successful at identifying those preconditions that would form the basis of decision trees for all 16 service categories.

Results of the Knowledge Acquisition Process

Having extracted a complete set of decision rules from domain experts, AIR's knowledge engineers have now completed an initial prototype of the computerized knowledge base. This first prototype has been developed using Nexpert Object®, a transportable and interoperable programming environment produced by Neuron Data, Inc. The prototype will continue through successive revisions as it is iteratively tested in AIR's usability testing laboratories and in the field. A thorough validation of the knowledge base, in terms of perceived utility and comparability to other expert samples, remains outside the scope of the present cooperative agreement but remains a high priority for future work.

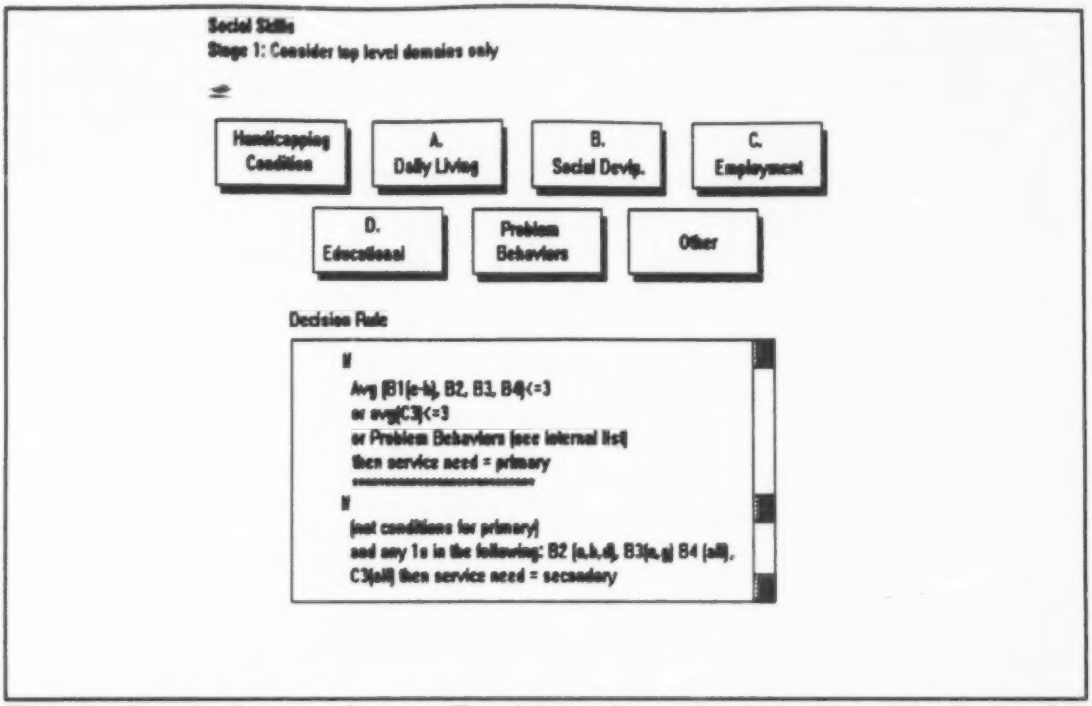

Figure 1. Example of a screen from an AIR tool designed to acquire clustered knowledge for one of 16 service categories.

Additionally, AIR staff has developed a revised version of the PASS assessment instrument and rater instructions based on input from Delphi, Template, and other project advisors and based on input from an earlier pilot test (i.e., an A.I.R. study that preceded the study discussed here). Following a review by the sponsor, the instrument was converted to the machine-scannable, field-test version that appears in *Attachment A*. The knowledge acquisition stage also provided information for revising the list of service categorizes, and their accompanying definitions (see *Attachment B*), that are used as outcomes of expert system processing.

Summary

This report covers activities conducted in the first and most crucial stage of expert system development: the acquisition of knowledge to be used as the foundation for the expert system prototype. Whereas expert system projects in many other domains are constructed with input from only one expert, the PASS expert system is being constructed with input from multiple experts, from around the United States, and in varying areas of specialization. Because the project must incorporate input from multiple sources, it is utilizing methodologies in knowledge acquisition that are designed to build consensus iteratively from a diversity of inputs.

Knowledge acquisition for the project began with a Delphi technique used to extract consensus from a panel of 31 experts with experience in determining the service needs of adults in a wide variety of contexts. Conducted by mail over three successive rounds, the Delphi technique (a) extracted an initial list of client characteristics associated with service needs under each of 16 service categories, (b) narrowed that list down to those characteristics voted by the panel to be especially evocative of a primary need for service and therefore *very important* to include in the expert system's knowledge base, and (c) provided an initial mapping of those characteristics to general areas covered by the PASS. The Delphi technique was followed by a three-day meeting of the Template Committee. The purpose of the Template Committee was (a) to provide knowledge engineers at AIR with data, in the form of recited verbal protocol, of how expert decision makers identified adult service needs based only on information contained in the PASS, (b) to use results of the Delphi process in specifying an initial set of decision rules for the PASS expert system, and (c) to consider and recommend revisions to the PASS instrument and service list.

As this phase of knowledge acquisition ends, Project PASS has at its disposal a wealth of previously unarticulated information regarding the manner in which PASS data collected on exiting students with disabilities may be used for anticipating adult service needs at national, state, and local levels. Efforts have been underway to reproduce faithfully this raw pool of information into an effective computerized system for anticipating adult needs. In a system of iterative prototype development, however, knowledge structuring does not imply an end to knowledge acquisition. As the evolving knowledge base is tested against new PASS data (from a national field test), the knowledge base will continue to grow and be refined.

Attachment A

The PASS Instrument

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1791 Arastradero Road
P.O. Box 1113
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(415) 493-3550

This instrument is for research purposes only. It is to be used only for the Project PASS field test, and for no assessment purposes beyond the scope of the Project. For further information: Peggie Campeau, AIR Project Director.

CONFIDENTIAL INFORMATION

Performance Assessment for Self-Sufficiency (PASS)

PASS ID | **OPTIONAL ID**

STUDENT'S DATE OF BIRTH — MO | DAY | YR

STUDENT'S GENDER
① Male ② Female

STUDENT'S ETHNICITY (Mark one)
① Black
② White
③ Hispanic
④ Asian/Pacific Islander
⑤ American Indian/ Alaskan Native

RATER'S NAME* Ⓐ Ⓑ

RATER'S PHONE NUMBER
( )

SCHOOL NAME

DISTRICT NAME

* The rater is the teacher or other school staff who knows the student best.

SCHOOL ZIP CODE

STUDENT'S DESIGNATED DISABLING CONDITION (Reflects Federal reporting categories -- Mark one)

① Mental Retardation (Mark severity if MR)
Ⓐ Mild Ⓑ Moderate Ⓒ Severe
② Speech or Language Impairment
③ Visual Impairment or Blindness
④ Specific Learning Disability
⑤ Serious Emotional Disturbance
⑥ Orthopedic Impairment
⑦ Other Health Impairment
⑧ Hearing Impairment or Deafness
⑨ Deaf-Blindness
⑩ Autism
⑪ Traumatic Brain Injury
⑫ Multiple Disabilities

- **When will/did student leave school?** → MO | YR

- **Under what condition will/did student leave school? (Mark one)**
① Graduate with diploma
② Graduate with certificate
③ Reach maximum age
④ Drop out
⑤ Other (Specify:)

- **How long have you known this student?**
① 0 - 2 months
② 3 - 6 months
③ 7 - 12 months
④ More than 12 months

- **In what kind of classroom do/did you have contact with this student? (Mark one)**
① Regular class
② Resource room (pull out)
③ Separate class
④ Separate school
⑤ Vocational community-based class

Signature of Rater | **Date**

- **Rater's Relationship to this Student**
① Teacher (provides ongoing, direct instruction)
Ⓐ Regular education Ⓑ Special education
② Consulting teacher (provides special education support)
③ Work experience/work study coordinator
④ Other (Specify:)

6457

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Mark all setting(s) in which performance is known to you. (Defined on p. 4 of Instructions)

S = School
W = Work place
H = Home
O = Other

Performance Rating Codes
(Defined on p. 4 of Instructions)

0. Unable to rate
1. Does not or cannot do
2. Does or can do with extensive assistance or supervision
3. Does or can do with some assistance or supervision
4. Does or can do independently

Functional Performance Indicators

B. Personal and Social Development

B-1. Communication skills

S W H O — 0 1 2 3 4

- a. Pays attention (i.e., acknowledges stimuli)
- b. Responds to some form of language (e.g., oral, written, signs, Braille)
- c. Communicates basic needs
- d. Speaks intelligibly
- e. Takes part in relevant conversations
- f. Expresses personal feelings appropriate to the situation (e.g., fear, joy)
- g. Asks questions and responds appropriately
- h. Uses telephone for information or assistance when needed
- i. Obtains information from want ads or telephone directory

B-2. Acting responsibly

S W H O — 0 1 2 3 4

- a. Follows rules
- b. Admits mistakes, offers to rectify errors of judgment or conduct
- c. Structures time well (e.g., maintains a schedule)
- d. Assists others when needed
- e. Makes decisions that are reasonable and timely
- f. Follows through on plans, decisions

B-3. Coping skills

S W H O — 0 1 2 3 4

- a. Manages own emotions (e.g., frustration, anger)
- b. Resists negative peer pressure
- c. Responds appropriately to others' negative remarks
- d. Works out compromises
- e. Adapts to changes in situations (e.g., new activities or people)
- f. Functions well under work or time pressure
- g. Identifies and takes steps to deal with interpersonal problems

B-4. Relationships with others

S W H O — 0 1 2 3 4

- a. Greets people appropriately
- b. Shares appropriately (e.g., property, time, space)
- c. Respects rights of others (e.g., their property, privacy)
- d. Interacts appropriately with individuals, including strangers
- e. Interacts appropriately with people in authority
- f. Interacts appropriately as a member of a group
- g. Makes and maintains close friends
- h. Takes part in leisure-time social activities or organized sports

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Mark all setting(s) in which performance is known to you. (Defined on p. 4 of Instructions)

S = School
W = Work place
H = Home
O = Other

Performance Rating Codes
(Defined on p. 4 of Instructions)

0. Unable to rate
1. Does not or cannot do
2. Does or can do with extensive assistance or supervision
3. Does or can do with some assistance or supervision
4. Does or can do independently

Functional Performance Indicators

D. Educational Performance

S W H O
Ⓢ Ⓦ Ⓗ Ⓞ

0 1 2 3 4

D-1. Reading (includes pictures, drawings, Braille, or other symbols)

a. Reads and comprehends survival readiness words (e.g., stop, danger)
b. Reads and follows simple 1-step or 2-step instructions
c. Reads and follows multistep instructions
d. Reads and comprehends the newspaper or similar periodicals
e. Uses reference materials (e.g., dictionary, encyclopedia)
f. Reads and comprehends textbooks at grade level

D-2. Writing (by hand, typewriter, computer, or other assistive devices)

a. Writes own name
b. Produces legible writing
c. Fills out simple forms
d. Composes simple sentences and simple paragraphs
e. Composes letters
f. Writes compositions that convey ideas clearly

D-3. Mathematics (may include use of assistive devices)

a. Counts to twenty
b. Tells time
c. Uses a calculator
d. Manually performs basic addition and subtraction
e. Manually performs basic multiplication and division
f. Solves simple math word problems
g. Manually calculates fractions and decimal values

D-4. Academic work habits and skills

a. Follows oral or interpretive (sign language) instructions
b. Follows written instructions
c. Completes assignments on time
d. Completes assignments satisfactorily
e. Takes notes in class

F. Other Information on Employment

1. **This student typically works independently on job-like assignments or tasks for: (Mark one)**

   ① 0 min. ② 15 min. ③ 30 min. ④ 60 min. ⑤ 120 min. ⑧ Don't know

2. **This student's vocational preparation included: (Mark all that apply)**

   ① Prevocational skills training, career awareness
   ② Vocational education, general
   ③ Vocational education, job-specific
   ④ School-based work experience
   ⑤ Community-based work experience
   ⑥ Other (Specify:) →
   ⑦ None
   ⑧ Don't know

3. **Has this student expressed a desire to pursue the following areas after leaving school? (Mark all that apply)**

   ① Work
   ② Postsecondary education
   ③ Vocational training
   ④ Independent living
   ⑤ Military
   ⑥ Homemaker
   ⑦ Other (Specify:) →
   ⑧ None
   ⑨ Don't know

G. Other Information on Training and Education

1. **Which of the following types of nonvocational training did this student receive in the community? (Mark all that apply)**

   ① Transportation
   ② Residential
   ③ Shopping
   ④ Accessing agency services
   ⑤ None
   ⑥ Don't know

2. **This student's most recently tested reading level is: (Mark one)**

   ① Grade 2 or lower
   ② Grade 3 - 6
   ③ Grade 7 - 9
   ④ Grade 10 or higher
   ⑤ No test results
   ⑥ Don't know

3. **This student's most recently tested mathematics level is: (Mark one)**

   ① Grade 2 or lower
   ② Grade 3 - 6
   ③ Grade 7 - 9
   ④ Grade 10 or higher
   ⑤ No test results
   ⑥ Don't know

4. **What instructional adaptations would this student need in postsecondary settings? (Mark all that apply)**

   ① Parallel modified curriculum
   ② Tutors
   ③ Notetakers
   ④ Computers
   ⑤ Enlarged print
   ⑥ Taped textbooks
   ⑦ Untimed tests
   ⑧ Test given orally
   ⑨ Testing outside group setting
   ⑩ Interpreter
   ⑪ Other (Specify:) →
   ⑫ None
   ⑬ Postsecondary not appropriate
   ⑭ Don't know

H. Major Problem Behaviors

1. **Does this student exhibit any problem behaviors to a degree that is likely to cause loss of job and/or friends, interfere seriously with employability and social adjustments, or restrict significantly residential and training placements? Consider both FREQUENCY and SEVERITY of the behavior.**

   ① Yes ② No ③ Don't know

   If yes, mark all that apply:

   ④ Exhibits highly unusual behavior (e.g., echoing, clicking, rocking)
   ⑤ Drools
   ⑥ Touches others inappropriately (e.g., too huggy)
   ⑦ Is violent or aggressive towards others
   ⑧ Exhibits inappropriate sexual behavior (e.g., masturbation, exposure, solicitation)
   ⑨ Hurts self
   ⑩ Runs away
   ⑪ Defaces or destroys property
   ⑫ Shows criminal behavior (e.g., steals)
   ⑬ Has been involved with criminal justice system
   ⑭ Is truant
   ⑮ Withdraws, refuses to speak
   ⑯ Shows severe depression
   ⑰ Practices substance abuse with drugs
   ⑱ Practices substance abuse with alcohol
   ⑲ Exhibits hyperactivity
   ⑳ Other (Specify:)

HR	MIN
0	0 0
1	1 1
	2 2
	3 3
	4 4
	5 5
	6
	7
	8
	9

! Please record stop time here →

7

AMERICAN INSTITUTES
FOR RESEARCH

PALO ALTO OFFICE
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This instrument is for research purposes only. It is to be used only for the Project PASS field test, and for no assessment purposes beyond the scope of the Project. For further information: Peggie Campeau, AIR Project Director.

Performance Assessment for Self-Sufficiency (PASS)

Instructions for Raters

In this field test of the PASS instrument, you will be asked to specify:

- descriptive student information, including major problem behaviors **(PASS pages 1, 6, 7)**
- ratings of student performance, including settings for the rated performance **(PASS pages 2-5)**

To do this, you will need:

- a No. 2 pencil or a blue/black pen
- a watch or a clock you can see

REMEMBER:

- Please mark your answers clearly in pencil or blue/black ink by completely filling in the appropriate bubbles and spaces.
- Look at your watch (or clock) and record the time in the spaces provided in the instrument (top of PASS page 2, bottom of page 7).
- Review the entire form after you have completed it to be sure you FILL IN A BUBBLE FOR EACH ITEM. Be sure to ERASE ANY ERRORS OR UNINTENDED RESPONSES COMPLETELY.

Special Instructions for Completing the 4-page Rating Scale (PASS pages 2-5)

Each page of the 4-page scale lists behaviors required in a particular area of regular adult life, whether or not a person has a disability. You are to select the appropriate rating code based on what you have observed, or what you know about the student from other knowledgeable persons.

Performance Rating Codes

0. Unable to rate
1. Does not or cannot do
2. Does or can do with extensive assistance or supervision
3. Does or can do with some assistance or supervision
4. Does or can do independently

EXAMPLE

0 1 2 3 4 c. Communicates basic needs
0 1 2 ● 4

The selection of the rating code "3" for this sample item indicates that the rater feels the student needs **some assistance or supervison** in order to communicate his or her basic needs. **See page 4 of these Instructions.**

EXAMPLE

0 1 2 3 4 h. Takes part in leisure-time social activities or organized sports
● 1 2 3 4

The selection of the rating code "0" for this sample item indicates that the rater feels **unable to rate** this behavior with confidence or accuracy, given what he or she knows about the student. **See page 4 of these Instructions.**

EXAMPLE

S W H O
● W H O

0 1 2 3 4
0 1 2 3 4 a. Follows rules
. .
. .
. .
0 1 2 3 4 f. Follows through on plans, decisions

You are also to indicate the **setting(s)** in which you know that behaviors are performed at the levels you have rated. The selection of the rating code S for this sample item indicates that the rater knows about these student behaviors in the **school** setting, but not in the other settings. **See page 4 of these Instructions.**

EXAMPLE

S W H O
● ● H O

0 1 2 3 4
0 1 2 3 4 a. Identifies values of coins and bills
. .
. .
. .
0 1 2 3 4 e. Calculates checkbook balance

The selection of two rating codes, **S and W**, indicates that the rater has observed (or knows about) these student behaviors in both the school and work settings. **See page 4 of these Instructions.**

Attachment B

Service List and Definitions

Service Categories and Definitions to Be Refined in Project PASS

Peggie Campeau, Project Director
American Institutes for Research
Palo Alto Office
P.O. Box 1113
Palo Alto, CA 94302

*NOTE: Revisions to an earlier list of service categories are indicated by brackets [for deletions] and **boldface** [for additions/substitutions].*

MOBILITY SERVICES (*other* than specialized transportation services): [Assistance or] Training related to personal mobility for individuals [with physical or sensory disabilities] **including destination training, map reading, and training in the use of technological aids.** *(Definition narrowed to focus on skills acquisition rather than provision of actual transportation, with addition of specific examples--as distinguished from Specialized Transportation Services.)*

SPECIALIZED TRANSPORTATION SERVICES: Acquisition of specialized transportation, including special public transportation, essential for employment, education, community living, or receipt of other services. *("Acquisition of" added to clarify that the category includes provision of transportation, not training in the use thereof.)*

TECHNOLOGICAL AIDS AND ADAPTIVE EQUIPMENT SERVICES: Evaluation for and provision of equipment, machines, prostheses, aids, and adaptive devices necessary for employment, education, community living, or receipt of other services, including equipment and devices for communication and mobility. *(no changes)*

MEDICAL AND MEDICALLY-RELATED SERVICES: Surgery, medication, physical or occupational therapy, and other medical treatments or services related to the disability. *(no changes)*

COMMUNICATION SERVICES: Assistance and training related to the act of communication, including **speech/language therapy,** interpreter services, reader services, braille training, and tactile interpreting services. *("Speech/language therapy" added to expand examples.)*

INDEPENDENT LIVING SERVICES: Training or assistance in performing basic daily living activities (e.g., cooking, laundry, hygiene, [transportation,] time management, financial management) to enable individuals with disabilities to live **with maximum independence in community.** *(Transportation deleted to maintain integrity of Specialized Transportation and Mobility services; ending phrase modified to emphasize independence as end goal.)*

OVER

RESIDENTIAL LIVING SERVICES: Programs to place or maintain individuals with disabilities in residential facilities (e.g., group homes) or in structured community living arrangements (e.g., supervised apartments). [including daily living skills training and related services] *(Service includes placement as well as maintenance; training in daily living skills dropped to eliminate overlap with Independent Living Services.)*

SOCIAL SKILLS TRAINING SERVICES: Training in the development of interpersonal social skills and social competencies essential to employment, education, and community living. *(no changes)*

MENTAL HEALTH SERVICES: Personal adjustment counseling, sex education or counseling, psychiatric or psychological therapy, substance abuse programs, and other mental health services. *(no changes)*

VOCATIONAL TRAINING AND JOB PLACEMENT SERVICES: Vocational assessment and time-limited services that include simple job referral and placement, vocational education programs, on-site training and placement, and short-term financial assistance. *(no changes)*

ONGOING EMPLOYMENT-RELATED SERVICES: Vocational assessment and long-term or periodic services necessary to maintain individuals with disabilities in suitable employment, including training, job coaches, supported employment programs, sheltered employment programs, and other support services related to employment. *(no changes)*

ALTERNATIVE EDUCATION SERVICES: Programs for continuing adult education, including Adult Basic Education (ABE), General Educational Development (GED), adult high school diploma, and adult compensatory or special education. *(no changes)*

SERVICES TO SUPPORT POSTSECONDARY EDUCATION: Special services necessary to enroll individuals with disabilities in technical school, community college, college, or university, and to maintain individuals in those institutions to reach specified [degree] level **of certification**; including counseling, curriculum adaptations, and **academic support.** [note-taking services] *("level of certification" used to broaden definition of competency beyond only a degree; "academic support" substituted to provide a more general example.)*

RECREATION AND LEISURE SERVICES: Training and support to enable individuals with disabilities to engage in appropriate recreation and leisure activities. *(no changes)*

FAMILY SERVICES: Support or assistance, including counseling, to families of individuals with disabilities necessary for the rehabilitation or increased independence of the individual with a disability. *(no changes)*

CASE MANAGEMENT SERVICES: Referral, evaluation, and counseling needed to help persons with disabilities secure services; including coordination, follow-up, and advocacy to assure delivery of appropriate services. *(no changes)*

Appendix C

Examples of Delphi Survey Instruments

Round 1: Preliminary Client Characteristics
Round 2: Highly Evocative Characteristics
Round 3: Mapping Exercise to General Areas in the PASS

INSTRUCTIONS FOR ROUND 1 OF THE DELPHI PROCESS

1. For each of 16 service categories, you will identify *up to three* client characteristics that are likely to trigger a decision that the service is *essential*. While there are many different characteristics that could signal the need for a particular service, we are looking for the paramount ones that would trigger your decision. *See Column A in the Examples below.* (If there are more than three client characteristics that you would rank as *paramount*, write on the reverse side of the form.) *It's NOT necessary to rank-order the client characteristics that you identify.*

2. We will assume that the key characteristics you identify pertain to *all* of the populations about which you are knowledgeable, unless you restrict your response to clients with a particular type(s) of disability(ies). *See Column B in the Examples below.*

3. You may give either generic characteristics (e.g., lacks mobility skills) or specific characteristics (e.g., cannot attend to own toileting needs).

4. If you do not feel qualified to respond for a particular service category, mark that page *Don't Know* at the top of the form.

5. If in your opinion the definition of a particular service category needs to be modified, *please edit directly on the form.*

EXAMPLES:

INDEPENDENT LIVING SERVICES
Training or assistance in performing basic daily living activities (e.g., cooking, laundry, hygiene, transportation, time management, financial management) to enable individuals with disabilities to live with minimal support in the community.

CLIENT CHARACTERISTICS (behavioral, attitudinal, etc.) that are likely to trigger a decision that this type of service is essential — A	TYPE (s) OF DISABILITY (ies) for which your entry in Column A is especially important — B
① (Describe) Client cannot feed self without help from another person.	(List) Ortho. or Other Health Impairment

If there are special conditions that would influence your decision about the need for service, please explain.
Has plans to share independent living domicile.

SOCIAL SKILLS TRAINING SERVICES
Training in the development of interpersonal social skills and social competencies essential to employment, education, and community living.

CLIENT CHARACTERISTICS (behavioral, attitudinal, etc.) that are likely to trigger a decision that this type of service is essential — A	TYPE (s) OF DISABILITY (ies) for which your entry in Column A is especially important — B
① (Describe) Client is very reluctant to talk or make eye contact with teachers or peers.	(List) All groups I deal with.

If there are special conditions that would influence your decision about the need for service, please explain.
Behavior persists in various settings (home, community, workplace).

MORE EXAMPLES:

ALTERNATIVE EDUCATION SERVICES

Programs for continuing adult education, including Adult Basic Education (ABE), General Educational Development (GED), adult high school diploma, and adult compensatory or special education.

CLIENT CHARACTERISTICS (behavioral, attitudinal, etc.) that are likely to trigger a decision that this type of service is essential (A)	TYPE (s) OF DISABILITY (ies) for which your entry in Column A is especially important (B)
① (Describe) Client has trouble on a job with tasks that require basic reading + math.	(List) LD, EMR

If there are special conditions that would influence your decision about the need for service, please explain.
Will not be able to hold the job without training in these skills.

SERVICES TO SUPPORT POSTSECONDARY EDUCATION

Special services necessary to enroll individuals with disabilities in technical school, community college, college, or university and to maintain individuals in these institutions to reach specified degree level; including counseling, curriculum adaptations, and note-taking services.

CLIENT CHARACTERISTICS (behavioral, attitudinal, etc.) that are likely to trigger a decision that this type of service is essential (A)	TYPE (s) OF DISABILITY (ies) for which your entry in Column A is especially important (B)
① (Describe) Client falls behind in course work.	(List) LD

If there are special conditions that would influence your decision about the need for service, please explain.
Asks for help with study skills.

COMMUNICATION SERVICES

Assistance and training related to the act of communication, including interpreter services, reader services, braille training, and tactile interpreting services.

CLIENT CHARACTERISTICS (behavioral, attitudinal, etc.) that are likely to trigger a decision that this type of service is essential (A)	TYPE (s) OF DISABILITY (ies) for which your entry in Column A is especially important (B)
① (Describe) Client does not speak intelligibly.	(List) Speech + Language Disorder, Deaf, Hard of Hearing, Blind

If there are special conditions that would influence your decision about the need for service, please explain.
Needs speech therapy for communication in post-secondary study or on the job.

Instructions for Round 2 of the Delphi Exercise

For each of 16 service categories, you have been provided with a summary of the client characteristics that field experts in Round 1 indicated were likely to trigger their decision that a particular kind of service was essential. Each summary includes an outline of the major client characteristics identified by the experts (middle column), as well as some specific examples of these client characteristics as encountered by the experts (shaded, right-hand column). The outlines attempt to capture the information provided by experts as clearly and comprehensively as possible. (Note that the outlines are *not* intended to be consistently parallel in content or grammatical construction.) The number in parentheses beside each lettered section of the outline is the number of experts who identified characteristics under that letter heading. The number in parentheses beside each Roman number heading is the aggregate number of characteristics provided by experts within the entire set.

A primary purpose of Round 2 is to identify those areas of client characteristics that should be included in the *decision rules* for the PASS Expert System, which will convert information about clients into estimates of anticipated service needs. (The decision rules comprise the "if-then" rule structure that will be used to project service needs.) Because the expert system must define a finite and economical set of rules, your task is to identify only those client characteristics that are associated with an **essential need for the service.**

A second purpose of Round 2 is to assess the adequacy of service list definitions, prior to developing the PASS Expert System.

Your input is essential to accomplish the above goals. Please follow these steps in completing Round 2 of the Delphi Exercise, for each service category:

1. Indicate, **with a check mark**, whether each client characteristic presented in the middle column--*"Areas of Service Need Identified by Field Experts in Round 1"*-- should be included in the decision rules for the PASS Expert System:

   - **Check "Very Important"** if that client characteristic **should be included** in the **decision rules--that is,** if that characteristic would definitely trigger your **decision that the service was** *essential.*

   - **Check "Unimportant"** if that client characteristic **should NOT be included** in the decision rules.

   - Check **"Undecided"** if you cannot decide whether or not that client characteristic should be included in the decision rules.

   Be sure to put one check mark beside every section of the outline with a Roman numeral and letter heading.

Also note that you do NOT need to make any decisions regarding the specific examples in the shaded, right-hand column. The examples are provided for illustrative purposes only.

2. Toward the end of some service categories, you are asked to determine whether selected client characteristics should be moved to another service category. In these cases, indicate, with a check mark: (a) whether to include the characteristic in the Expert System decision rules, as you did in Step 1, and (b) whether the characteristic should in fact be moved to the specified service category (or to another category you feel would make more sense.)

3. If you do not feel qualified to respond for a particular service category, mark that set *Don't Know* at the top of the form.

4. Please indicate any **comments** you have about the service area definitions, the client characteristics or examples, the organization of the categories, or the appropriateness of their inclusion in the space provided. Feel free to edit (change, cross out, or add) or comment directly on the form, as you wish.

5. At the end of the Round 2 packet is a chart (colored page) entitled *"Additional Service Categories."* A few experts in Round 1 suggested that several service categories be added to the 16 already defined. Please indicate on the chart whether each category should be classified under an existing service category, or whether that category should **not** be included within the PASS Expert System framework at all.

ROUND 2 OF THE DELPHI SURVEY: Mental Health Services, Page 1

MENTAL HEALTH SERVICES
Personal adjustment counseling, sex education or counseling, psychiatric or psychological therapy, substance abuse programs, and other mental health services.

DEGREE OF IMPORTANCE for Inclusion in the Project PASS Expert System (Check ONE)			Areas of Service Need Identified by Field Experts in Round 1	(Selected Examples from Field Experts)
Very important	Unim-portant	Undecided		
__	__	__	I. Exhibits psychiatric/psychological problems requiring treatment	
			A. Shows signs of depression (14, 25, 26, 28, 05, 10, 27, 33, 04, 01, 12, 08)	Is suicidal (e.g., newly diabled, talks of wanting to die) Is withdrawn and unwilling to participate in community Misses classes/assignments due to depression Exhibits post-traumatic depression Doesn't eat Doesn't sleep
__	__	__	B. Exhibits angry/aggressive behavior (04, 25, 29, 33, 06, 16, 23, 24, 32, 36, 05, 26, 20)	Harms/threatens to harm self or others Has violent episodes Has inappropriate outbursts due to inability to handle stress and supervision Assaults others Destroys property
__	__	__	C. Exhibits symptoms of psychosis (05, 31, 32, 01, 26, 33, 10, 22, 28, 09)	Is withdrawn/out of touch with reality Hallucinates/perseverates Is paranoic/delusional Has extreme, psychotic-like behavior, i.e., does not speak, stares, has psychotic breaks, is fragile Has history of psychiatric hospitalizations Is not attending to basic needs, i.e., is unkempt, is losing weight, has no address

DEGREE OF IMPORTANCE for Inclusion in the Project PASS Expert System (Check ONE)			Areas of Service Need Identified by Field Experts in Round 1	(Selected Examples from Field Experts)
Very Important	Unimportant	Undecided		
			I. Continued—Exhibits psychiatric/psychological problems requiring treatment	
—	—	—	D. Has sexual problems (10, 16, 20, 25, 26, 19, 22 24, 28, 38, 13, 12)	Exhibits inappropriate sexual behavior (e.g., sex play in public) Does not practice safe sex Expresses desire for sex education Cannot control sexual urges on job or public Has TH induced impotence
—	—	—	H. Has other symptoms/signs indicating need for treatment (16)	
—	—	—	A. Exhibits difficult behavior on the job (09, 13, 30, 31)	Unable to keep personal problems out of work environment Is having trouble with members of opposite sex at work Has been fired/has gaps in work history Unable to get along with co-workers Sporadically attends 5-day per week program
—	—	—	B. Expresses need for assistance (26, 32)	
—	—	—	C. Has great difficulty accepting/adjusting to disability (23, 12, 06)	Will not accept vision problem despite inability read small print Has trouble adapting to loss of cognitive functioning Feels isolated due to disability
—	—	—	D. Cannot control behavior in school setting/home (15)	
—	—	—	E. Cannot accept responsibility for own failures/blames others (19)	

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DEGREE OF IMPORTANCE for Inclusion in the Project PASS Expert System (Check ONE)			Areas of Service Need Identified by Field Experts in Round 1	(Selected Examples from Field Experts)
Very Important	Unimportant	Undecided		
—	—	—	III. Shows signs of substance abuse (9, 10, 14, 15 28, 30, 19, 32)	
—	—	—	A. Appears to have been under influence of alcohol/drugs (04, 27, 26)	Is red-eyed Is drowsy/unalert Is unusually nervous/"hyper" Has difficulty in coordination/speech Has seizures from substance abuse Productivity reduced due to alcohol abuse
—	—	—	B. Has other signs of alcohol/drug problems (17, 06, 38, 17, 20)	Has lost job(s) due to alcohol Was arrested under the influence Is frequently "sick" from work due to alcohol problem
—	—	—	IV. Shows signs of being abused physically or sexually	
—	—	—	A. Reported to have been abused (17, 32)	
—	—	—	B. Has bruises/admits abuse (1)	
—	—	—	C. Expresses concern about sexual, physical, or substance abuse (4)	

COMMENTS? (Please reference your comments to the outline by number or letter. Continue comments on back of page if necessary.)

The needs described below were suggested in connection with "Mental Health Services." They could also be classifed under a different service category. Should the item be MOVED to another category? Check or write your response in the spaces provided.

DEGREE OF IMPORTANCE for Inclusion in the Project PASS Expert System (Check ONE)			ADDITIONAL Needs Identified by Field Experts in Round 1	(Selected Examples from Field Experts)	
Very Important	Unim-portant	Undecided			
__	__	__	Unable to drive car (30)	Lacks driver's license, for no apparent reason	Move to "SPECIALIZED TRANSPORTATION SERVICES"? Yes __ No __
__	__	__	Seeks competitive employment (31)	Lives in foster care residence and requests part-time employment	Move to "VOC. TRAINING & JOB PLACEMENT SERVICES"? Yes __ No __

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Information and Instructions for Round 3 of the Delphi Exercise

Purpose

The primary purpose of Round 3 of the Delphi is to "map" client characteristics that experts considered **essential** for inclusion in the knowledge base for the Project PASS Expert System onto the content areas in the PASS instrument and to identify gaps in the instrument's coverage. (The project abstract we mailed you a few months ago described this draft instrument, which is still under development and will be refined on the basis of the Delphi process and a national field test.) Your input from Round 3 will be used to develop a preliminary set of decision rules by which the PASS Expert System will link data obtained from the PASS instrument to estimates of anticipated service needs. Your comments will also be used to refine the PASS instrument prior to the field test.

Why the Lists Are Shorter This Time

For each of 16 service categories, you have been provided with a shortened list of the client characteristics (*right-hand column of each page*) that expert consensus in Round 2 indicated were **Very Important** to include in the knowledge base and rule structure for the PASS Expert System. In our analysis of responses to Round 2, we established a threshold value, or *rating index*, by which to identify those characteristics that expert consensus indicated were essential to include. The number in parentheses beside each characteristic is the rating index for that characteristic. The calculation for the index was made as follows: Responses were coded on a three-point scale (+1 = Important; -1 = Unimportant; 0 = Undecided); sum values were calculated for each client characteristic, and were then adjusted by the total number of respondents who rated the characteristic to obtain a proportional rating, or "rating index" (i.e., the sum value was divided by the number of respondents to obtain an adjusted sum); a threshold value of .60 and above was established to determine which characteristics to consider including in the expert system knowledge base and rule structure.

Each list also reflects your suggestions for refining the wording and for moving selected items to a different service category. (We are still analyzing your suggestions for improving the definitions of service categories.)

OVER !

Instructions

In addition to the 16 lists, you have also been provided with a **Content Outline for the PASS Assessment Instrument** (*blue sheet*). In this "mapping" exercise, you will indicate one or more topic areas on the PASS Content Outline with which each characteristic in the lists might be associated. As a convenience, we have already indicated in the *left-hand column* of each page where *we* would place the characteristics in the right-hand column. Depending on the specificity of the characteristic, we have in some cases suggested a main topic area (e.g., A, B), a group of topic areas (e.g., A through E), or a sub-topic area(s) (e.g., A-1, B-2). In still other cases, we have used "F" (NO CODE) to indicate that the characteristic does not, in fact, seem to fit within the existing content areas on the PASS Content Outline. (This signals a possible "gap" in the coverage presently provided by the PASS instrument.)

Please follow these steps in completing Round 3 of the Delphi Exercise, for each service category:

1. Read the entire list of characteristics in each service category to get a sense of how that category fits into the PASS Content Outline before attempting to make your decision about an individual characteristic.

2. For each characteristic, indicate whether you AGREE or DISAGREE with the topic area(s) we have assigned--that is:

   - If you AGREE with the suggested topic area, **put an "X" or check mark** in the "Agree" column.

   - If you DISAGREE with the suggested topic area and believe that another topic area(s) is more appropriate, **specify the preferred topic area(s)** in the "Disagree" column.

   - If you AGREE with the suggested topic area but also want to ADD a topic area(s), **put an "X" or check mark in the "Agree" column AND specify the additional topic area(s)** in the "Disagree" column.

   Be sure to mark the "Agree" and/or "Disagree" column beside EVERY characteristic that has lines beside it. See the EXAMPLES on the following pages.

3. If you do not feel qualified to respond for a particular service category, mark that set *"Don't Know"* at the top of the form.

4. Write in the **Comments** box if you have further suggestions about the Content Outline for the PASS instrument, the client characteristics, or the service area definitions. Also feel free to edit or comment directly on the form, as you wish.

EXAMPLES:

MOBILITY SERVICES (other than specialized transportation services):
Assistance, counseling, or training related to personal mobility for individuals with disabilities

Suggested Topic Area(s) on Content Outline (blue sheet)	Agree (X)	Disagree: Specify Preferred Topic Area(s)	Areas of Service Need Identified "Very Important" by Consensus of Experts in Round 2
A-5	X	—	I. Has severe physical disability that requires the use of specialized equipment for ambulation (.93)
A-5	X	—	A. Requires wheelchair or other electric vehicle (.87)

I/I.A: Expert agrees that these characteristics belong in sub-topic area "A-5, Mobility and Transportation Skills."

CASE MANAGEMENT SERVICES:
Referral, evaluation, and counseling needed to help persons with disabilities secure services; including coordination, follow-up, and advocacy to assure delivery of appropriate services.

Suggested Topic Area(s) on Content Outline (blue sheet)	Agree (X)	Disagree: Specify Preferred Topic Area(s)	Areas of Service Need Identified "Very Important" by Consensus of Experts in Round 2
A through E	___	F	II. Has other problems that warrant case management services (1.0)
A through E	___	F	A. Severe disability requires ongoing coordination in a service area(s) (1.0)
F	X	___	IV. Lives with family that has difficulty/is unable to care for client (.72)
F	X	___	A. Family lacks knowledge to provide or identify services (.72)

II/II.A: Expert feels that characteristics do not fit clearly into existing categories and assigns "F, No Code."

IV/IV.A: Expert agrees that "F" is appropriate because characteristics apply to family, not client.

OVER !

MENTAL HEALTH SERVICES

Personal adjustment counseling, sex education or counseling, psychiatric or psychological therapy, substance abuse programs, and other mental health services.

Suggested Topic Area(s) on Content Outline (blue sheet)	Agree (X)	Disagree: Specify Preferred Topic Area(s)	Areas of Service Need Identified "Very Important" by Consensus of Experts in Round 2
E	X	+ A-2	III. Shows signs of substance abuse (1.0)
E	X	+ A-2	A. Appears to have been under influence of alcohol/drugs (.89)

III/III.A: Expert agrees that substance abuse belongs in "E, Major Problem Behaviors," but feels it <u>also</u> belongs in "A-2, Health and Safety."

RECREATION AND LEISURE SERVICES

Training and support to enable individuals with disabilities to engage in appropriate recreation and leisure activities.

Suggested Topic Area(s) on Content Outline (blue sheet)	Agree (X)	Disagree: Specify Preferred Topic Area(s)	Areas of Service Need Identified "Very Important" by Consensus of Experts in Round 2
			III. Has emotional/psychological problems that impede participation
B-4	X	___	A. Is socially isolated/lonely (.78)
B-2	X	___	D. Uses poor judgment about safe/affordable recreation options (.80)
A-2	X	___	

III.A/D: Expert agrees with sub-topic areas, including <u>both</u> sub-topic areas for III.D. (Note that main heading III does not require an assessment since it has no lines beside it.)

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Appendix D

Delphi Summary Table

Linkage of PASS Domains A-E to Service Categories, Reflected by Delphi Round 3*

PASS	Alternative Education	Previous Education	Voc. Trng/ Job Place.	Ongoing Reinforcement	Youth Advis/ Reinforcement	Transportation	Mobility	Social Skills	Family	Community Utilize	Residential Living	Indep. Living	Recreational/ Leisure	Medical	Mental	Case Management
A. DAILY LIVING	29	22			28				27		29	29	3			29
A-1 Housekeeping											29	29				
A-2 Healthy/safety					29	6					29	29	29	27	29	2
A-3 Food skills											29	2				
A-4 Money mngmt	29										29	29		2		
A-5 Health/transport.					29	29	30				27		28	18		26
A-6 Housekeeping											4	29				
B. PERSONAL/SOCIAL	3	26		26	29			29	29	2	27		27	2	29	29
B-1 Communication	2	29			29			29		29			2			3
B-2 Acting responsibly	26					21			2		6	2	26	22	26	
B-3 Coping	3		4		2	4		2			29	2		3	29	2
B-4 Relationships			3	6	2			29	24	4	24		29	29	6	
C. EMPLOYMENT	29	4	29	29	29					2				2		29
C-1 Job seeking			29	29	3			29								
C-2 Work performance			29	29	27			6		3	2	3		2		
C-3 Working w/ others			29	29	4			29		4						
D. EDUCATIONAL	29	29	26	2	29										2	29
D-1 Reading	27	29				2										
D-2 Writing		2			2											
D-3 Mathematics	27										2	3				
D-4 Academ. work habits	29	2														
E. PROB. BEHAVIORS		19	3	29		29		29	29	3	29		2	27	30	29

NOTE: A-2 PASS items refer to Health and Safety Skills, NOT actually the need for medical services.
B-2 PASS items themselves don't suggest need for Mental Health services, as strongly as Delphi experts interpreted item Heading "Acting responsibly."

* Number in each cell represents number of Delphi experts who linked domain area to service category.

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